UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,710	02/27/2007	Dinah Wen-Yee Sah	13751-035US1 A193 US	5819

26168 7590 03/22/2011

FISH & RICHARDSON
P.O. BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
GAMETT, DANIEL C	

ART UNIT	PAPER NUMBER
1647	

NOTIFICATION DATE	DELIVERY MODE
03/22/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PATDOCTC@fr.com

Office Action Summary	Application No.	Applicant(s)	
	10/553,710	SAH ET AL.	
	Examiner	Art Unit	
	DANIEL C. GAMETT	1647	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 October 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/17/2011*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-24 are under examination.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-24 are rejected under 35 U.S.C. 102(e) as being anticipated by US 7442370, filed January 31, 2003 (of record).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

4. While the '370 patent claims polymer-conjugated, mutated neublastin dimers, the specification teaches that alternative embodiments may include the same truncated neublastin polypeptides 99-112 amino acids in length that are recited in instant claim 2 (column 2, lines 46-61, columns 13 and 14; Table 4). In some embodiments the neublastin polypeptides are modified amino-terminus with a linear or branched polyalkylene glycol moiety, e.g., a polyethylene glycol

(PEG) moiety, (column 3, line 9-12, column 23, lines 6-8) with an average molecular weight of between about 2 kDa and about 100 kDa, or more narrowly about 10 kDa, about 15 kDa, about 20 kDa, about 25 kDa, about 30 kDa, about 40 kDa (column 22,, lines 23-42). In some embodiments, at least one polypeptide is glycosylated (column 3, line 9-12). The '370 patent teaches that the neublastin dimers may be formulated into pharmaceutical compositions (column 3, lines 24-27) which are administered in doses from 0.1 μg/kg to 1000 μg /kg, from 1 μg /kg to 100 μg /kg, or from 1 μg /kg to 30 μg /kg by various routes, e.g., intramuscular, subcutaneous or intravenous (column 3, lines 33-43). The neublastin compositions are used in methods of activating the RET receptor and treating neuropathic pain, including treating tactile allodynia, and hyperalgia (optionally together with an analgesic agent), and for reducing loss of pain sensitivity associated with neuropathy (column 3, lines 33-43; column 35, line 43 to column 38, line 34). Therefore, each of the limitation of instant claims 1-24 is disclosed in the '370 patent.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 20040242472 ('Shelton'; of record), filed Dec. 9, 2001; US 6284540, Sept. 4, 2001 ('Milbrandt';

of record); US 6593133, July 15, 2003 ('Johansen'; of record); US 7067473, filed July 14, 1999. ('Masure'; of record).

7. Shelton discloses artemin, which is identical to NBN113 (see SEQ ID NO:1 of Shelton). Shelton teaches covalent modification of artemin with polyalkylene glycols, specifically including polyethylene glycol (PEG) [0204]. Shelton teaches that artemin is administered systemically to treat or prevent neuronal damage resulting from a neuropathy or neurodegenerative disease in daily dosages from about 0.01 μg/kg up to 50 mg/kg or more, ([0028] [0336] [0339], Claims 1-3). Shelton demonstrated efficacy of artemin in a spared nerve injury model animal of neuropathic pain (Example 4). Shelton cites earlier work showing that artemin activates RET receptors [0016]. Shelton, therefore, discloses a neublastin polypeptide recited in instant claim 2, and its administration for a condition recited in instant claims 14 and 24, using the same methods and doses recited in instant claims 17-22.

8. Milbrandt discloses forms of artemin which are identical to NBN113, NBN116, and NBN140 (see SEQ ID NO's: 3-5 of Milbrandt). Milbrandt teaches that artemin is likely to naturally exist as a dimer (column 17, lines 17-21). Milbrandt teaches that artemin can be stably linked to a polymer such as polyethylene glycol to obtain desirable properties of solubility, stability, half-life and other pharmaceutically advantageous properties (column 25, lines 45-56). Milbrandt teaches that artemin should be administered to provide trophic support for neurons in patients with conditions such as peripheral neuropathy (column 5, line 63 to column 6, line 29). Milbrandt demonstrates that artemin activates RET receptors (Fig. 9).

9. Johansen discloses mature NBN113, NBN116, and NBN140 (see SEQ ID NO's: 7, 10, and 11 of Johansen). Johansen teaches that smaller peptides derived from NBN retain

neurotrophic activity and that preferred embodiments retain the 7 conserved cysteine residues that are characteristic of the TGF-beta superfamily (paragraph bridging columns 1-2; column 2 lines 21-24, Examples 6-9). Neublastin may be a multimer of two or more neublastin polypeptides, e.g., a neublastin dimer (column 3, lines 32-45). Johansen teaches that neublastin is glycosylated (column 12, lines 22-40). Johansen teaches that neublastin polypeptides are useful for treating a defect in a neuron, such as lesioned or traumatized neurons, and for treating neuropathy (column 3 lines 46-57).

10. Masure discloses enovin, which is identical to NBN113 (see SEQ ID NO: 3 of Masure). Masure demonstrated the ability of enovin to reverse chemotherapy-induced sensory deficits (column 26, line 53 to column 29, line 25). The results identify enovin as a candidate for treating or alleviating pain syndromes with a peripheral or central neurogenic component, as well as conductance disturbances (column 29, lines 17-22).

11. In view of Shelton, Milbrandt, Johansen, and Masure it is evident that many of the NBN polypeptides of the instant claims have been explicitly disclosed in the prior art as being glycosylated dimers, modified by PEG, and useful in the instantly claimed methods. Johansen especially suggests that many forms of NBN may be useable. Each element of the instant claims performs as would be predicted in view of the teachings and suggestions found in the prior art. The Supreme Court reaffirmed principles based on its precedent that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." KSR International Co. v. Teleflex Inc. (KSR), 550 U.S. 398 at, 82 USPQ2d at 1395.

Conclusion

12. No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel C. Gamett, Ph.D., whose telephone number is (571)272-1853. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeffrey Stucker can be reached on (571)272-0911. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/DANIEL C GAMETT/
Examiner, Art Unit 1647